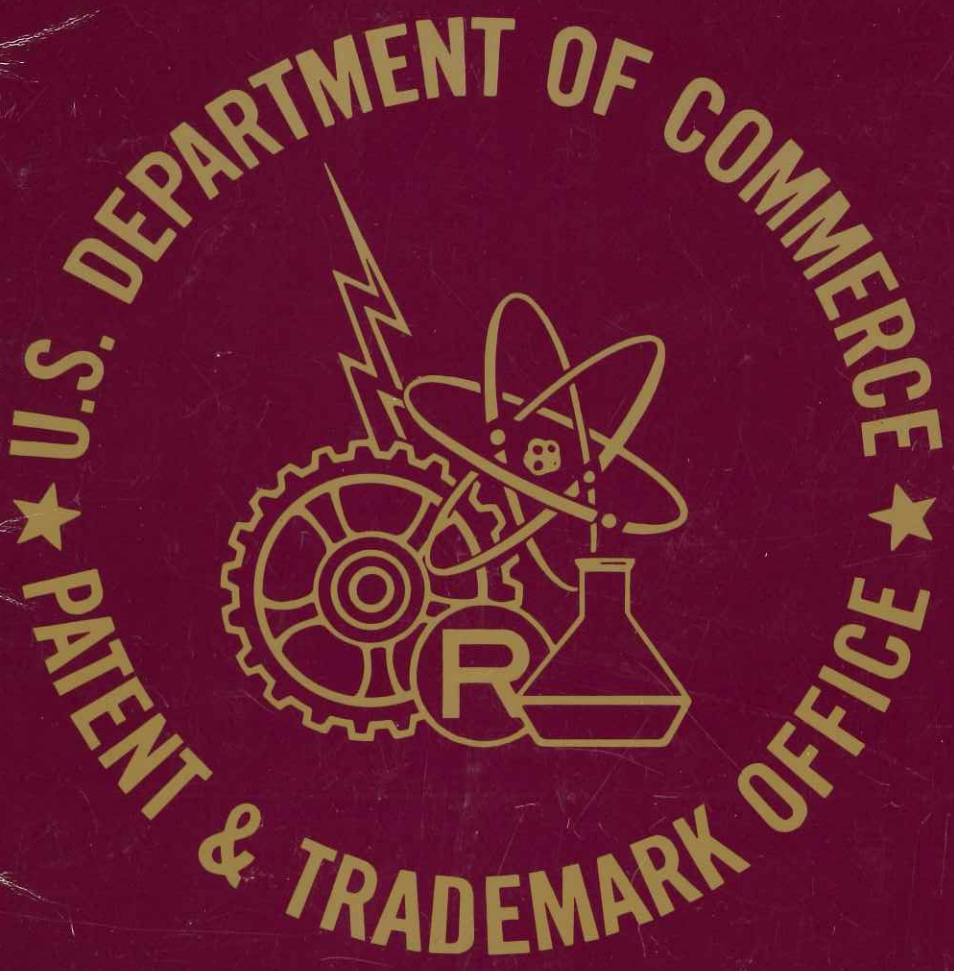
Automating the U.S. Patent and Trademark Office



The Plan for Automating the U.S. PTO

The U.S. Patent and Trademark Office (PTO) is automating its procedures in accordance with a plan approved in 1983. The plan encompasses three functional areas and three consecutive stages. The functional areas are trademark automation, patent and data base automation, and automatic data processing support systems.

The consecutive stages provide milestones for developing each of the three functional areas. The Stage 1 milestones include automating patent group 220 as a test for the entire Automated Patent System and completing the automation of both public search and internal functions for the trademark system. Management systems will continue to rely on existing computer systems during this stage.

During Stage 2, all internal functions for both patent and trademark operations will be fully automated. Patent documents will be stored in a form readily accessible for search and retrieval. This means that all documents will be available to all users at all times—they will never be misplaced, misfiled or "in use" by another person. The system will include a fully integrated management information system, and preliminary automation will be provided for the public search files.

In Stage 3, the last stage of system development, public access to the system will be expanded. Direct on-line exchange of information with international patent and trademark systems will be developed. Other automatic systems to support dissemination of information also will be extended.

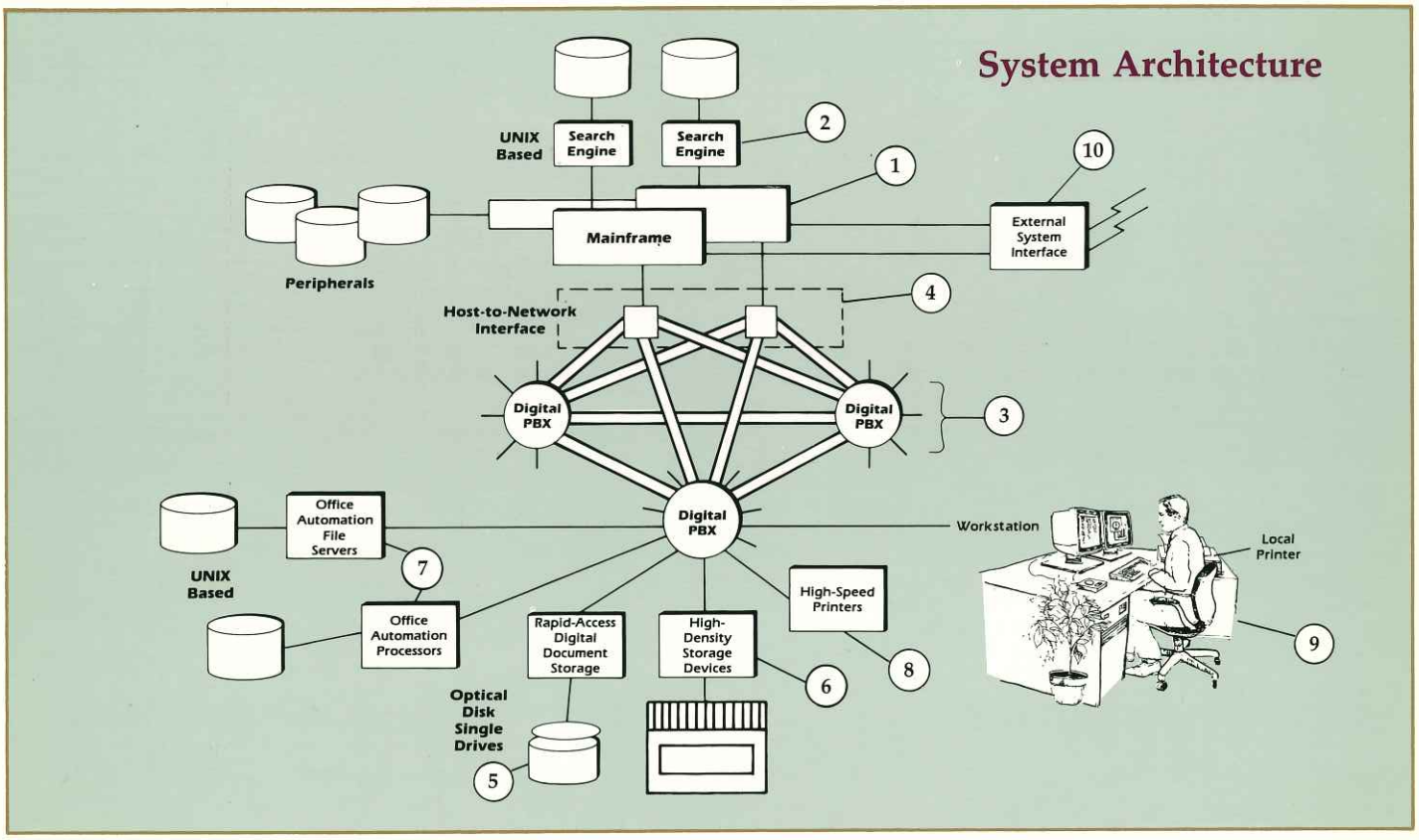
Highly competitive procurement processes were followed in selecting contractors to develop the various systems. The MITRE corporation was awarded a contract in November 1982 to support the PTO. The support included requirements analysis for both patents and trademarks, engineering studies and help in evaluating contractor proposals. A contract to design and implement the Automated Patent System was awarded to Planning Research Corporation in April 1984, with Chemical Abstracts Service as a major subcontractor. This contract encompassed the overall system design, software development and hardware acquisition, as well as the integration, test and maintenance of the system.

Contract awards for the capture of imagery and text complete the major acquisitions necessary to fulfill the plan for automation of the U.S. Patent and Trademark Office.

Plan Milestones

Stage 1	Stage 2	Stage 3
Patent • Group 220 Automated **Trademarks** • Internal Functions Automated • Public Search Automated **Management** • Current Systems	**Patent and Trademarks** • All Internal Functions Automated • Paperless Search Files (100% Integrity) • Initial Public Search Automated **Management** • Fully Integrated Management Information System	**Patent and Trademarks** • Expanded Public Search • Expanded Telecommunications • Extended Dissemination Support • Direct Exchanges with Other Patent Offices
1983–1985	1986–1987	1988–1990

System Architecture for Automated Patent System



1 Mainframe. Two very large-scale mainframes provide indexes to approximately 30 terabytes storage capacity in a distributed system; support search and retrieval; manage system; maintain text and image data base.

2 Search engines. 40 or more microcomputers act as parallel processors for text and classification searches, using Boolean logic to locate word and symbol combinations and relationships in text data base.

3 Digital PBX. A network based on digital switches unites all elements of the system. Connections over the network are transparent to end users.

4 Host-to-network interface. Translates network protocol between the mainframe and the workstations and other devices connected to the mainframe via the network.

5 Rapid-access digital document storage. Single optical disk contains frequently accessed information, such as post-1970 granted patents.

6 High-density storage devices. Optical disk libraries, or "juke boxes" store a second copy of frequently used information and two copies of less frequently accessed information.

7 Workstation servers. Office automation file server allows user to store individual work. Office automation processor provides electronic mail delivery, spreadsheet capacity, calendar, word processing, etc. Latest software deliveries are stored in local storage devices, automatically update workstation software.

8 Central and group laser printer. Centralized printing provides 300 line-per-inch page images with each printer operating at more than 10 pages per minute.

9 Workstations. For use of examiners, paralegal, technical and clerical personnel, more than 1,800 workstations are the primary user interface with the patent processing system. Workstations provide access to the system for patent application processing and full office automation functions. See more detailed description on facing page.

10 External system interfaces. Gateways that provide telecommunication with commercial data bases.

The Workstation is "The System" for Most Users

More than 1,800 workstations will be "the system" for most of its users. When documents arrive in the mailroom, they will be electronically entered into the system; from that time on, all processes related to patent applications and grants will be handled at workstations.

Most workstations have two 150-line-per-inch 17-19" display screens that display full-size pages larger than the original—either text or graphic images—zoom to 300 lines per inch for detail and can "window" multiple displays.

Designed to be comfortable for people, the workstation uses a "mouse" or graphic pad, has a movable keyboard and a local printer. It contains microprocessors, 300 megabytes of local storage and software.

In addition to highly specialized application software, each workstation provides office automation functions such as electronic mail, calendar, calculator, directory search, spreadsheet, text comparison, word processing and business graphics.

Entire Data Base on Optical Disks

The electronic, digital data base will contain both text and image data. Text data will include patents issued since 1970, all new patent applications, Japanese and European patent abstracts in English, PTO manuals, patent statutes and appeal board decisions. Digital facsimile images will include patent drawings since 1970, all pre-1970 U.S. patents, and selected literature and foreign patents.

Data will be accessible through a full-text word search and through document identification on the basis of information such as the U.S. patent classification system or the international patent classification system.

Documents that are accessed frequently will be stored on a single optical disk providing rapid access. A second copy of all frequently accessed documents, as well as two copies of all other documents, will be stored on as many as 200 high-density optical disks. These will be contained in "juke box" components, with the system automatically locating the correct disk for requested data, mounting it on line and transmitting the image to the workstation.

System Benefits

The Automated Patent System provides a number of benefits to the U.S. Patent and Trademark Office. Most important, it will make all documents available to all authorized users at all times—the paperless data base means that documents can never be misplaced, misfiled or "in use" by another person.

Rather than spending hours searching for paper documents, PTO personnel will use their workstations to search for—and find—all relevant data and examine any document within seconds. All patents and applications will be integrated into the system, so that regardless of their status they will be available for review.

The improved system will increase the integrity of the patent issuance operation and therefore the quality of a granted patent.

The entire document data base that in paper form occupies the core of three 11-story buildings will fit into one room when converted to optical disks.

Converting all documents to digital form will make it faster and easier to exchange information with foreign patent systems. While initially the exchange will be made through physical shipment of magnetic tapes, eventually the systems can be interconnected electronically.

Produced for the U.S. Patent and Trademark Office
by Planning Research Corporation

QUESTIONS AND ANSWERS FOR EMPLOYEE BRIEFING

ON THE AUTOMATED PATENT SYSTEM

1. Who is developing the APS?

The Automated Patent System (APS) is being developed by Planning Research Corporation (PRC), as the prime contractor with Chemical Abstracts Service (CAS) as principal sub-contractor. The work is being performed under the direction and consultation of the Office of Automation and PTO users. The Mitre Corporation is serving as the technical advisor to the PTO.

2. How much time will be spent looking at the workstation screen?

Virtually every part of processing an application will involve work done from (or on) the workstation. Examiners and support personnel will probably stay "on line" much of the day. This does not mean that you must stare at the screen for long periods without interruption, or must stay at your workstation without a break. Users will still have to consult with each other, and have the option of walking to a fellow employee's workstation or calling someone on the phone. Local printers also give examiners the option of looking at a paper copy. Initially at least, examiners will use some paper files when necessary or desirable.

3. How long will it take each patent or application to come up on the screen?

<u>It is a requirement</u> that the first document of a requested subclass be delivered to the user in less than 10 seconds. Subsequent pages of that document, or the first page of the next document in the subclass, are required to be displayed in less than 1 second. This is known as the "flip rate", and is a difficult demand on the system. PRC has designed an architecture to satisfy this requirement. Current state of the art and system architecture indicate that these requirements can be met.

4. Can I look at more than one application at a time?

Yes, using dual screens and the windowing capability, you can view many at one time, but enter information on only one. This limitation is for protection from accidental changes to the data base.

5. Can more than one workstation display the same information at the same time?

Yes, any number of workstations can display the same information at the same time.

6. Can the workstation be used when holding interviews?

The APS workstation display screens are large enough so that both the examiner and an attorney can view the application. Paper copy or the attorney's file can also be used.

7. What will happen to the paper search files when we automate?

We will retain the paper search files until we have full confidence in the APS and no longer need them.

8. Will I be able to read the small type in patents?

The APS is designed to enable the viewer to read the smallest type used in printing the text of U.S. patents. This is accomplished by means of a high resolution, 17" or 19" screen displaying a "larger than life" image of the source documents. Should a viewer have difficulty distinguishing features of a complex drawing or a subscript of a chemical formula, a zoom function can be used. This feature provides an image twice the normal size. Generally, chemical formula subscripts and 4-point type should be readable without zoom.

9. Will air conditioning demands be greater than now and will those demands be met?

There are specific air conditioning requirements associated with the workstation and they will be met.

10. Will the workstation include a comfortable chair?

Comfortable seating is extremely important and each APS user will be provided with a modern, ergonomically-designed chair.

11. What is being done about eye strain?

Every step has been taken to ensure that our displays will be easy on the eyes. Eyestrain has been recognized as a possible problem in computer terminal use. This eyestrain,

or asthenopia, can come from two sources. It can be generated by the video display itself or by ambient lighting conditions. Our video displays have been specified as flicker-free, with the ability to image dark on light or light on dark as desired by the user. The screens will be large enough to allow reading of small type and include a zoom capability. In addition, the option of printing a hard copy of screen information is always available. Lighting will be adjusted as necessary in the user work areas to avoid glare.

12. Will I have to type? Will I get typing training?

No examiner will be required to type his or her office actions. However, use of the keyboard is required to operate the workstation, and keyboard training, including the basic elements of touch typing, will be provided. Examiners who wish to type their own office actions, or to draft them as they do now, will be permitted to do so.

13. What training will be provided on the APS?

Each user will be fully trained on both the APS in general and in detail on the use of the APS in performing that user's job. Separate groups of courses will be provided for different categories of users. There will be a combination of classroom training and on-the-job training. Detailed reference manuals will be developed.

14. Will examiner goals be increased?

At present, no change in examiner goals is contemplated.

15. How will clerical positions be affected by the APS?

In the Patent Examining Corps, most clerical functions will continue to be performed, but through automation rather than manually. Certain functions such as reference filing and paper movement functions will be eliminated. In other areas, different changes will occur. Many documentation support jobs, for example, will no longer be performed, but many of these have already been contracted out. Additionally, those that will be eliminated will be phased out over a period of years. Initial patent processing will include scanning; but where that will be performed has not been determined. Where possible and practical, existing personnel will be retrained.

16. Will management be able to tell when my workstation is in use? What type of workstation usage statistics will be kept?

The system will automatically store usage information for all of its components. We intend to obtain basically two types of information from the system. The first would be non-person-specific information on the system usage for use by maintenance personnel to adjust and "tune" the system for maximum performance and for use by supervisory personnel to review general operating procedures and practices on the system. The second is person-specific information of the type now obtained from PALM to evaluate individual, Art Unit, and Group performance. The system will not be designed to monitor what a specific employee is doing every minute of the day.

17. What happens to ME when the system goes down; when my workstation goes down?

The APS has been designed so that breakdowns apparent to the user will be extremely rare. It is designed with reliable components that are arranged in both a modular and redundant fashion. Each major system has duplicate equipment to ensure that if one major component breaks down, another exactly like it is readily available. For example, the mainframe processor is composed of two mainframe computers designed to prevent a mainframe breakdown. Each digital disc is installed on a least two jukeboxes so that if one jukebox is down or in use, data can still be retrieved from the disc on the other jukebox. The network is composed of many reliable hard wires with completely interchangeable switches so that alternate pathways are available in case of failure.

Since the workstation and the network are independent in a systems sense, any data which is stored in the workstation can be utilized even while a system component such as a jukebox and its backup are down.

In case of a workstation failure, repairs will be available from a maintenance crew permanently stationed in Crystal City and on-call during working hours. Meanwhile, a user could use any other workstation to complete a task or start a new one. Workstations are not used to permanently or uniquely store data bases or personal files, so that if a user's workstation goes down, such information will be accessable on another.

18. Are we going to have work-related personal files? Who will have access to them?

Yes, work-related personal files can be created at the workstation. At present these files will be viewable and changeable only by the person who created them, and the supervisor, when appropriate. Unofficial digests may be created by anyone, but changed only by the person who created them.

19. How will I consult with other examiners?

By using the phone, in person, or by electronic mail at the workstation.

20. How will my search be recorded?

It is presently planned that the search file history of a patent will contain an identification of the search file documents displayed on the screen during the search, as well as the search requests and queries used.

21. When a document is requested, will the full document be retrieved?

Yes, the full document will be retrieved upon request. That answer is not as simple as it appears. In doing a classified search, the decision has not yet been made whether the entire document, i.e., patent reference, will be loaded in the workstation initially, or only the first page, or only the drawings. We are undertaking studies to determine with what frequency examiners normally look beyond the first page, and whether the second page needs to be retreived as quickly as successive first pages.

The system requirements demand that the first page, as well as successive pages, be available in less than one second.

22. What access security will be provided?

The design calls for a unique user password to get on the system, and a hierarchy for access to obtain the capability to change data in the system. In addition, Group 220, Security, will have its own independent, or stand alone, system and access controls.

23. How many hours during the day/week will the system be up?

It is presently planned that the system will be available 11½ hours/day, 5 days/week, and weekends and evenings, as needed and authorized, and as maintenance allows.

24. Will the workstation screen image be a copy of the patent (such as a microfiche) or a computer-generated image?

It will be a computer-generated image in the same dual column format as printed patents.

25. What will be the resolution of the printer output?

The examiner workstation and Group printers will both have a 300 points/inch capability. Other printers will be sized to meet the requirements of the location.

26. Will the system combine a word search and a classified search?

The APS allows an examiner to word search the post-1970 U.S. patents using a powerful system of Boolean operators (i.e., AND, OR, NOT...). The user can also conduct a class/subclass search of all U.S. and foreign patents and non-patent literature. These two techniques can be combined to allow an examiner to word search within any set of subclasses of post-1970 U.S. patents. This allows us to use the power of the APS and the skill of our examiners to quickly and comprehensively find the prior art relevant to an application.

27. Will I still be able to do a class/subclass search as I do now?

Yes, the only difference is that the pages will be "flipped" electronically rather than by hand. You will be able to start with the most recent art, the oldest art, or any place in between. In addition, such a classified search can be augmented by any of the search and retrieval capabilities discussed above -- word search capabilities, foreign patents, English language abstracts and non-patent literature.

28. Will foreign patents and non-patent literature be included?

Foreign patents and non-patent literature will be included in the APS database to an extent far beyond that which is available today. The inclusion of this information, however, will gradually evolve instead of all being at the same time. The data base will first include all U.S. patents. We have agreed with the European Patent Office and Japanese Patent Office to exchange all PCT minimum documentation in machine readable form -- i.e., Japanese and selected European and other foreign patents from 1920 to date. In addition, we are negotiating for the inclusion of English language abstracts of Japanese and non-English language patents. The English language abstracts, if we can obtain them, should be word searchable, and the foreign patents will be searchable under the International Classification System (IPC) as maintained by the European Patent Office (EPO), with concordance between the U.S. and the European classification systems. The IPC as maintained by the EPO was chosen because non-English language patents were carefully classified into that system by Europeans who usually understand the language of the document and because controls and records on the location of the documents in the IPC were carefully maintained and are available on magnetic tape.

29. Will the workstation accomodate a handicapped person?

The workstation can accomodate many handicap situations. The terminal is considered a preferred way for many handicapped persons to access information and communicate.

GLOSSARY
OF TERMS AND ACROMYNS
FOR THE USER OF THE AUTOMATED PATENT SYSTEM

TERMS

Architecture	The general design of the APS, or any computer system.
Archival	Data permanently stored for safety, or long-term storage.
Backfile	That part of any file which is prior to an arbitrary date; in the APS, the patents not created on the new system, i.e., all patents up to now.
Bit	Binary digit; a 1 or a 0 stored by a computer and used as a single piece of electronic information. Eight bits in a group are called a "byte," and can represent a character.
Boolean operators	Functions such as "and", "or" and "not" which link terms in a search request. An example would be a search request for all patents with the words, "tungsten carbide and drill bit or drill."
Byte	A coded series of 8 bits that usually represents a number or letter.
Cursor	The place on a VDT screen where attention is being focused. Or a frustrated user.
Data base	A body of collected information which can be retrieved.
Data compression	A technique to reduce the space needed to store data.
Default	A condition that a particular program selects unless otherwise instructed.
Disc; disk	A flat circular plate used to store data.
Distributed processing	Information handling which occurs at other hardware locations in addition to the mainframe or central processing unit.
Ergonomic	Designed to be comfortable to humans.
ETHERNET	A network connection system which is widely used in industry for sending information to many points.

GLOSSARY

Gigabyte (Gb)	One billion bytes. One typed page usually contains about 5000 bytes.
Graphics tablet	Workstation hardware (usually a pad and a stylus) that allows input of hand-drawn sketches.
Hardware	The devices which make up an ADP system, e.g., a printer, mainframe, VDT, keyboard, etc., as opposed to the software.
Image	The electronic "photograph" of a document, either text or a drawing. A page coded in image form cannot be word searched.
Jukebox	A device for handling and reading multiple stored discs that moves one disc over to a spindle to be read, similar to the music jukeboxes.
Magnetic disc	A disc whose information is stored and retrieved magnetically.
Mainframe	A large centrally-located computer.
Megabyte (Mb)	One million bytes.
Microcomputer	A computer on one integrated circuit (chip).
Mouse	A desktop hand-operated cursor controller.
Optical disc	A disc whose digital information is stored and retrieved using light.
Prime	The main contractor on a project. PRC in our case.
Proposal	The offer of a bidder to do work under contract in response to an RFP.
Raster image	An image formed on a video screen by successive horizontal scan lines.
Search engine	A microcomputer dedicated to word searching text.
Software	The programs in a computer which perform the requested functions.
Spread sheet	A program that automatically calculates rows and columns of numbers.

GLOSSARY

Subcontractor	A contractor who provides services for the general contractor.
Terrabyte (Tb)	A trillion bytes; a thousand billion bytes. The APS will be storing 20 terrabytes, which is a tremendous amount of data.
Text	Words; in the APS, that data which is captured in character code (ASCII), distinguished from graphic or tabular data.
Transparent	Invisible in effect; at the workstation, the APS operations will be transparent to the user, and seem to be entirely performed by the workstation.

ACRONYMS

ADP	Automated Data Processing
ASCII	American Standard Code for Information Interchange -- the code for storing characters
APS	Automated Patent System -- our new computer system
CAS	Chemical Abstract Service -- writing most of APS software
CDD	Critical Design Document -- the final design, after preliminary design
CDS	Classification Data System
COM	Computer Output Microfiche
CPU	Central Processing Unit -- main processing component of a computer
CRT	Cathode-Ray Tube -- the screen
CWU	Complex Work Unit -- graphics embedded in the text of a patent
DIOS	Data Input-Output System -- responsible for preparing and delivering data to APS
DBMS	Data Base Management System -- a general computer data handling program
DRD	Data Requirements Document -- a list of all data stored in APS
FRD	Functional Requirements Document -- a list of the requirements APS must satisfy

ACRONYMS

HTN	Host to Network -- a device needed so that the workstation can communicate with the mainframe
ICAPS	Image Capture and Processing System -- makes an electronic "photograph" of documents for APS
IBX	Integrated Business Exchange -- computerized electronic switch
MSS	Management Services System -- will replace PALM on the APS
MITRE	PTO's technical consultant
NPL	Non-Patent Literature
OA	Office of Automation
OACI	Office of Automation Concepts Implementation -- responsible for overseeeing the design of the APS
OAFS	Office Automation File Server -- holds files used by workstation
OASP	Office Automation Support Processor -- supplies programs the workstation user needs
OCR	Optical Character Recognition -- scans and converts paper printed characters into electronic code
OIIS	Office of Image and Information Systems -- part of OA in charge of DIOS
OSET	Office of Systems Engineering and Telecommunications
PCMB	Patent Configuration Management Board -- oversees policy decisions for automation
PDR	Preliminary Design Document
PPI	Points per Inch
PBX	Public Branch Exchange -- computerized electronic switch
PRC	Planning Research Corporation -- prime contractor for APS
RAM	Random-Access Memory -- usable general memory of a computer
RFP	Request for Proposals -- used to solicit bids
ROM	Read-Only Memory -- contains factory loaded data that cannot be changed
SOC	Systems Operating Concept -- a narrative of how the system will be used
S/R	Search and Retrieval -- part of APS
T/I	Text and Image -- part of APS
UNIX	Proprietary Microprocessor Operating System -- used on APS workstations
VDT	Video Display Terminal -- same as CRT or "screen"
WSS	Workstation Subsystem -- part of APS

What is Being Automated?

- Searching
  - Classified Files to Electronic Form
  - Automated Search Tools
  - Text Searching
  - Access to External Data Bases
  - Classification/Index Searching
- Application Processing
- Other Processing, e.g., Assignments
- Office Procedures (Office Automation)
- Management Systems
- Dissemination

Who is Involved in Automation?

- Office of Automation
- Users
- Department of Commerce and General Services Administration
- Contractors
  - MITRE - Technical Advisor
  - PRC/CAS - Systems Contractor
  - DIOS and Other Contractors
- Trilateral Agreement Partners
  - EPO and 11 Member States
  - JPO

Users Involved

- Examiner and Other Detailees
- User Review Teams
- Management Review Groups
  - Automation Coordinating Committee
  - Patent Configuration Management Board (PCMB)
  - Examining Corps Clerical Procedure Committee
- Briefings, Demos and Feedback
  - Group 220
  - Managers
  - POPA and POEU
  - All Employees
  - Public Users (Ad Hoc Committee)

Plan Milestones

Stage 1

Patents

- Group 220 Testbed Automated

Trademarks

- Internal Functions Automated
- Public Search Automated

Management

- Current Systems

1983-1985

Stage 2

Patents and Trademarks

- All Internal Functions Automated
- Paperless Search Files (100% Integrity)
- Initial Public Search Automated

Management

- Fully Integrated Management Information System

1986-1987

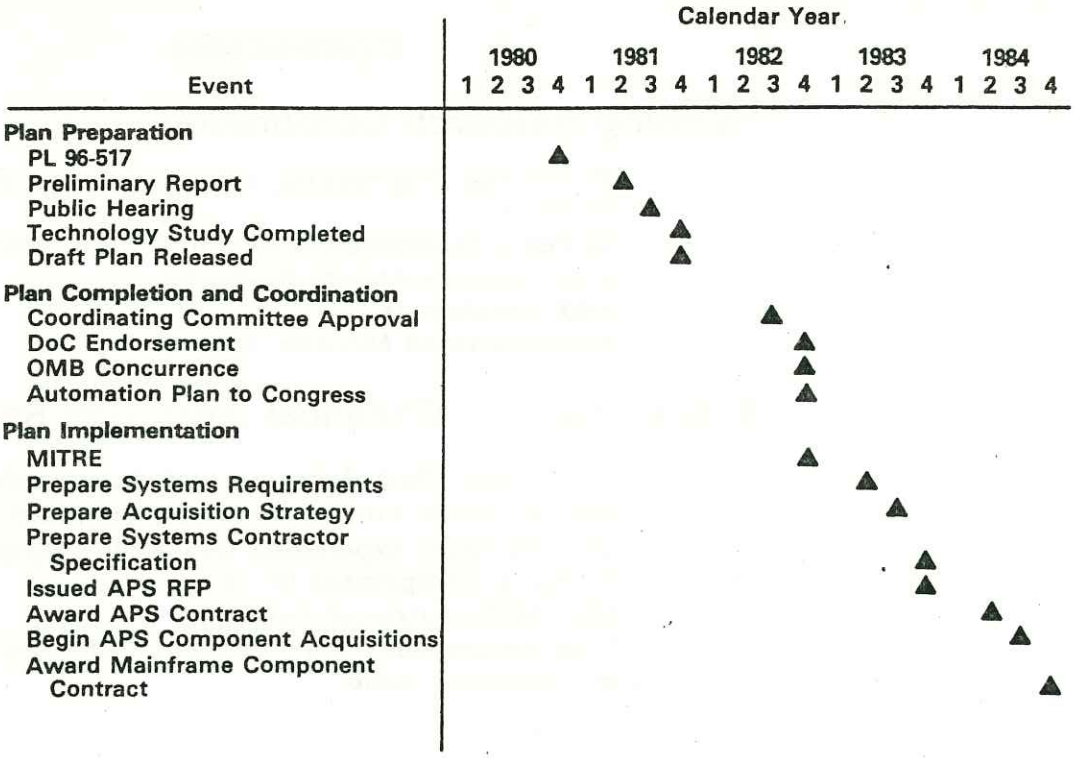
Stage 3

Patents and Trademarks

- Expanded Public Search
- Expanded Telecommunications
- Extended Dissemination Support
- Direct Exchanges With Other

1988-1990

Patent Automation Background



Patent and Trademark Automation

Systems Engineering Contractor

Mitre Corporation

- Not For Profit Organization Established in 1925 at the Request of the U.S. Air Force
- 25 Years of Experience As a Systems Engineering Contractor for Government Agencies
- $300 Million Annual Revenues
- 5000 Employees World Wide
- Corporate Headquarters
  Bedford, Massachusetts
  Civilian Agency Headquarters,
  McLean, Virginia

Automated Patent System

Contractors

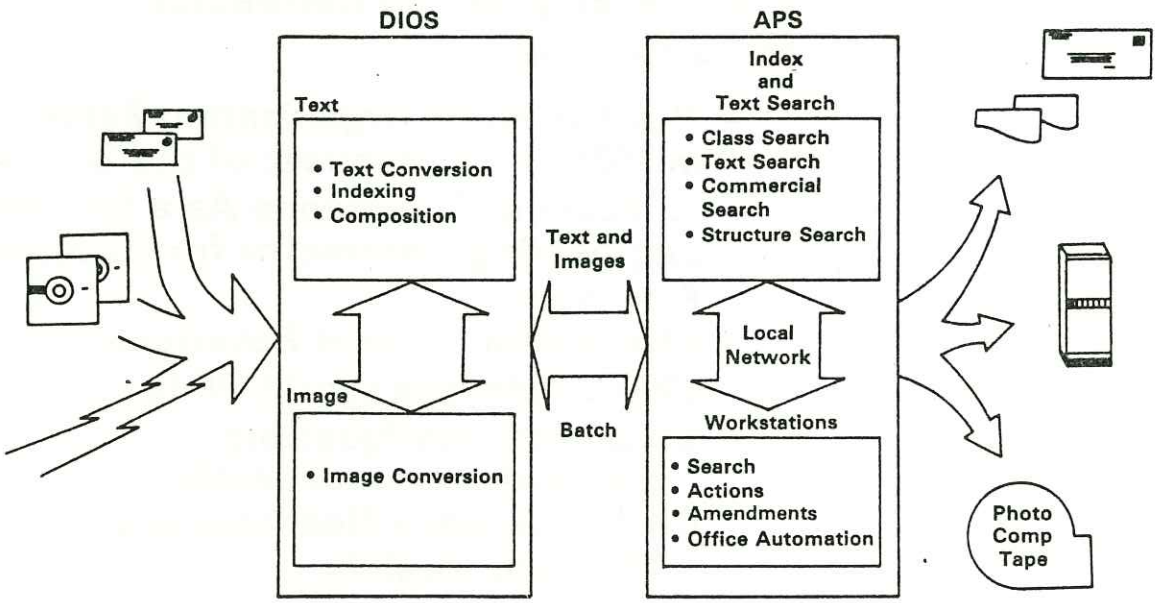
Planning Research Corporation

- To Provide Engineering, Information and Procurement Services
- 30 Years Experience in Systems Engineering/Integration
- $300+ Million Annual Revenues
- 5,600 Employees
- Headquartered McLean, Virginia

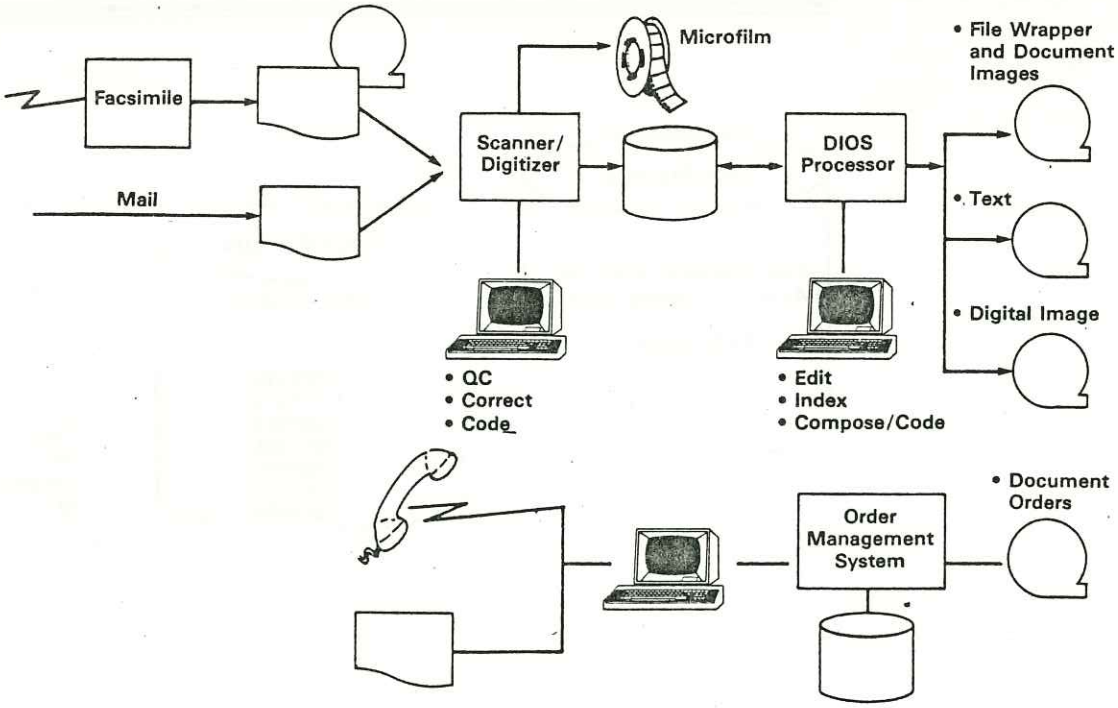
Subcontractor - Chemical Abstracts Service

- To Provide Most Software and Data Services
- Not for Profit Arm of American Chemical Society
- Over 20 Years Experience Developing Large-Scale Systems Comparable to APS
- $60+ Million Annual Revenues
- 1,200 Employees - 200+ Systems Software Staff
- In Columbus, Ohio

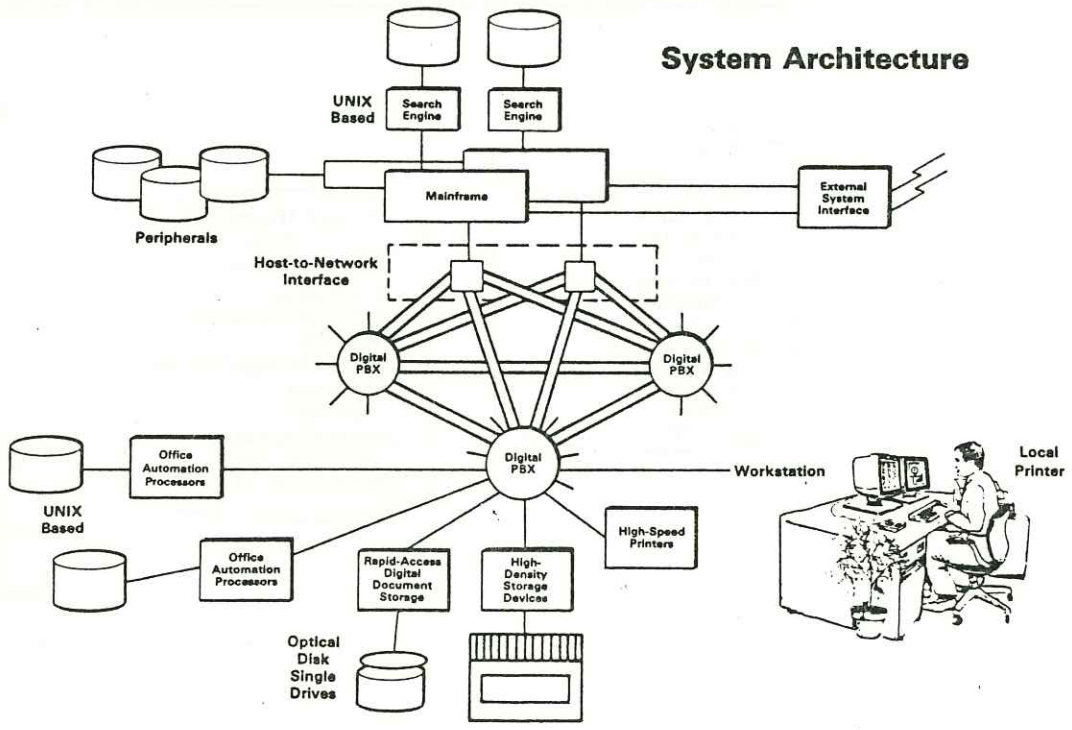
Automated Patent System General Concept



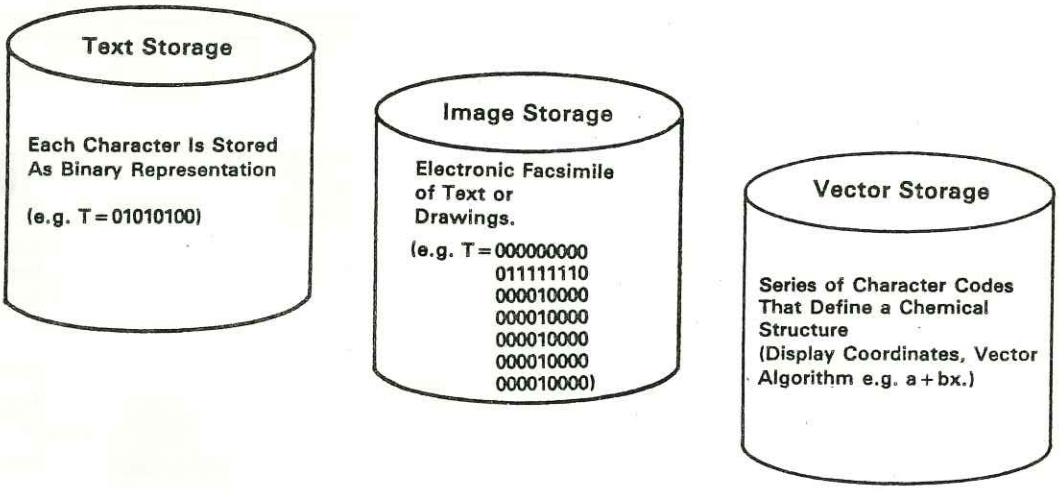
Data Input/Output System (DIOS) Architectural Concept



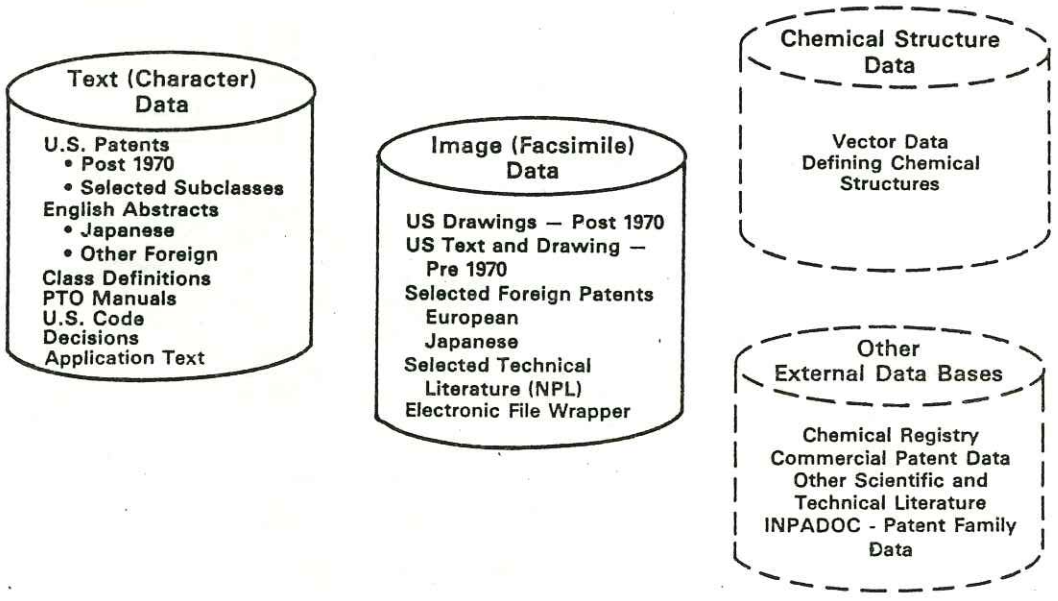
Automated Patent System



Electronic Data Bases
Types



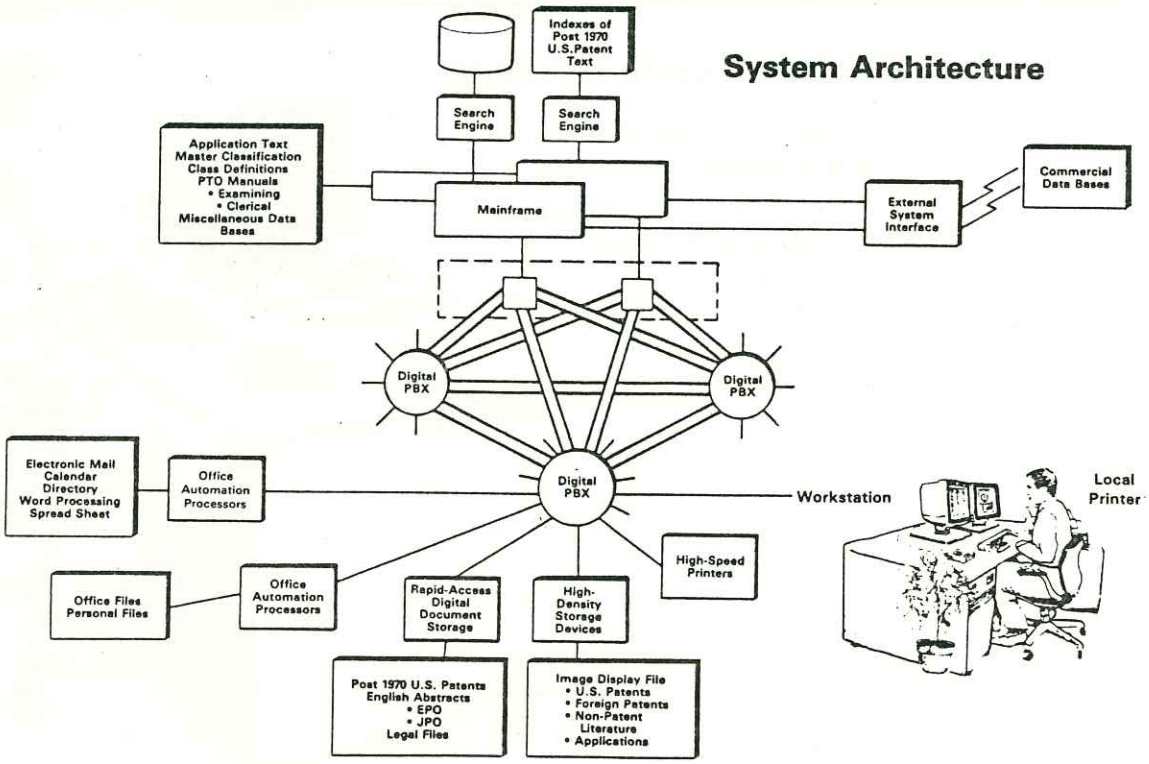
Electronic Data Bases
Contents



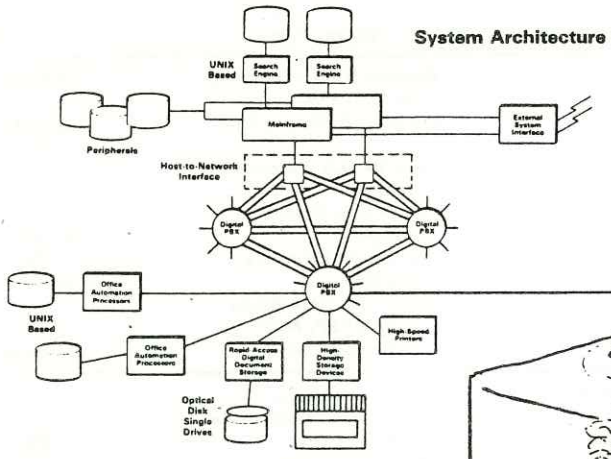
Data Base Sources

Originator	Data Type	Volume
United States	Backfile U.S. Patent Text for Post 1970	24 Billion Characters
	Future U.S. Patent Text	32 Billion Characters Present to Year 2000
	Backfile U.S. Patent Images	36 Million Pages
	Future U.S. Patent Images	8.4 Million Pages Present to Year 2000
	Non-Patent Literature Images	
	Misc. Text Data Bases (e.g. MPEP, MCF, Definitions, etc.)	1.7 Billion Characters
Japanese Patent Office	English Language Abstracts of Japanese Patents - Text	~600,000 Abstracts
	Japanese Patents - Images	19 Million Pages
European Patent Office and Member States	European Patents Images	Up to 50 Million Pages
	English Language Abstracts	Future
	Full Text	Future

Automated Patent System Index and Data Locations



Automated Patent System

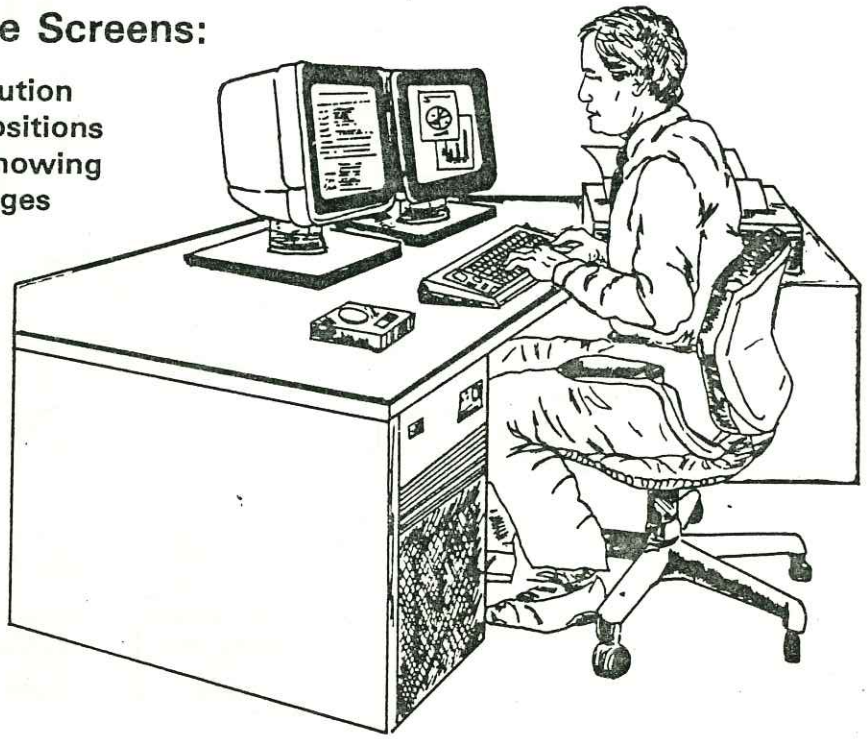


Workstation

Automated Patent System Workstation

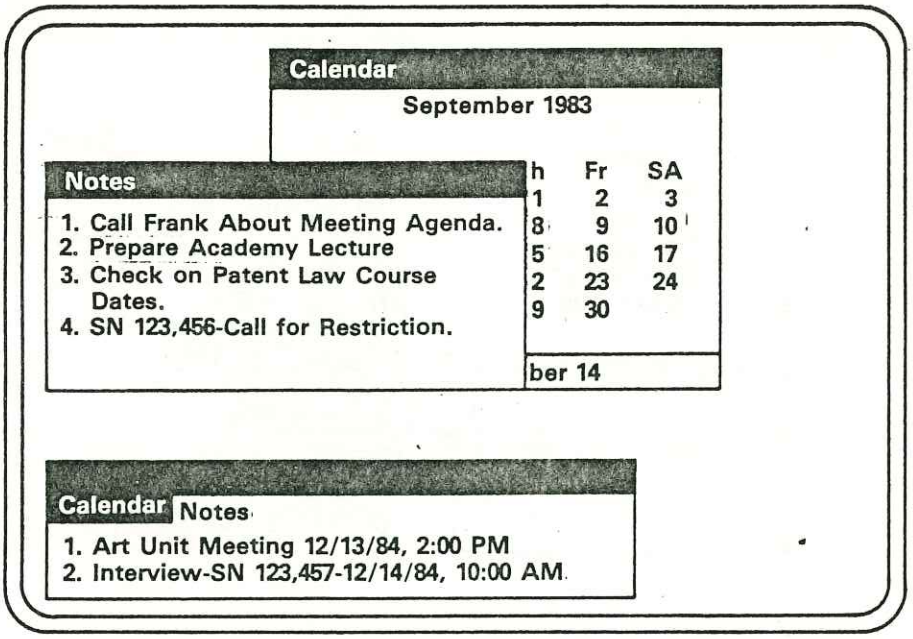
Dual or Single Screens:

- 150 LPI Resolution
- Adjustable Positions
- Capable of Showing Text and Images
- 17" or 19"
- Zoom

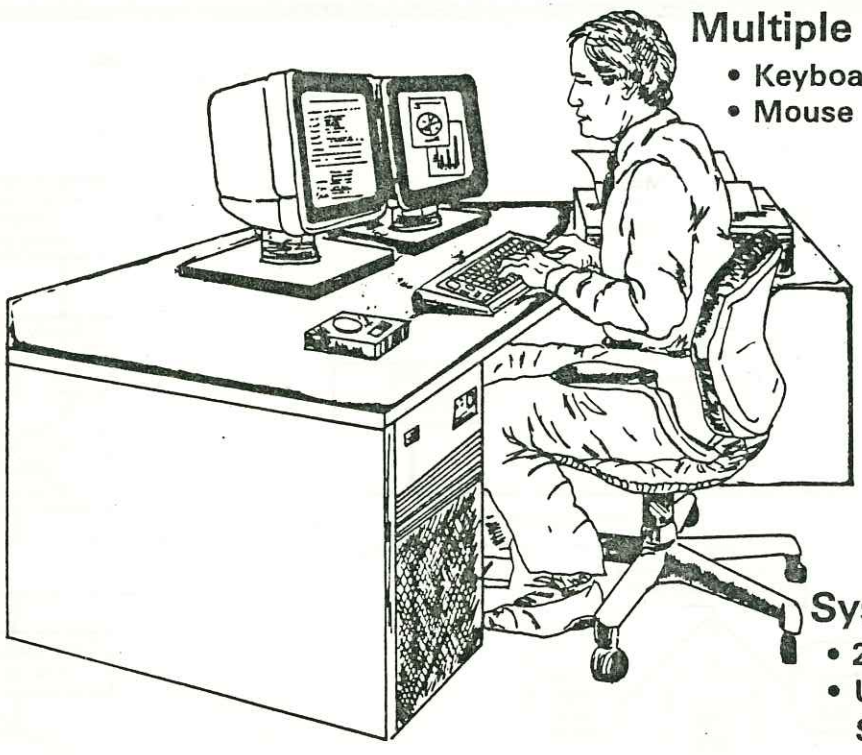


Automated Patent System Workstation

Windowing Software



Automated Patent System Workstation



Multiple Input Devices

- Keyboard
- Mouse or Graphics Tablet

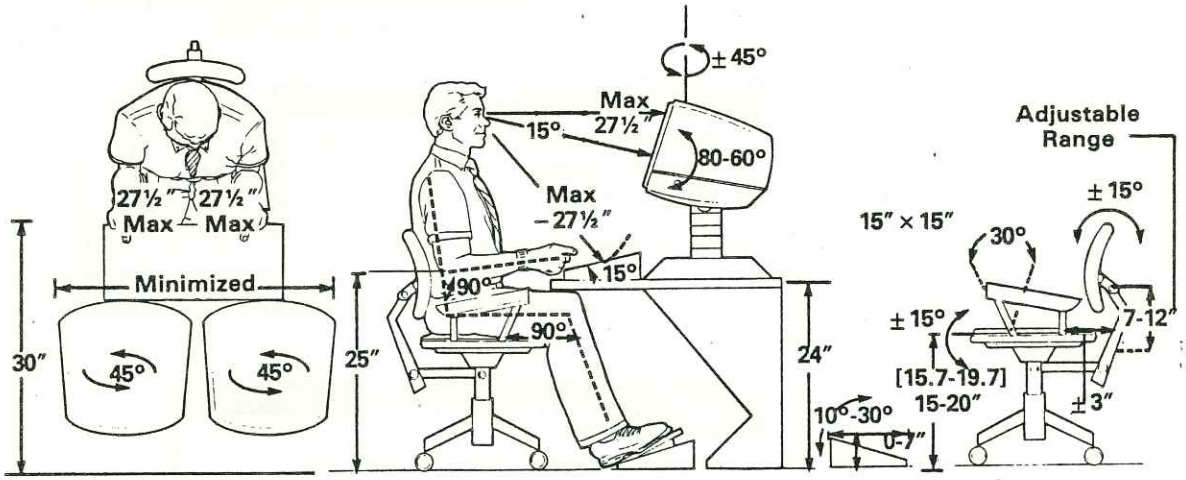
Local Printer

- 300 lpi
- 5 + pgs/min

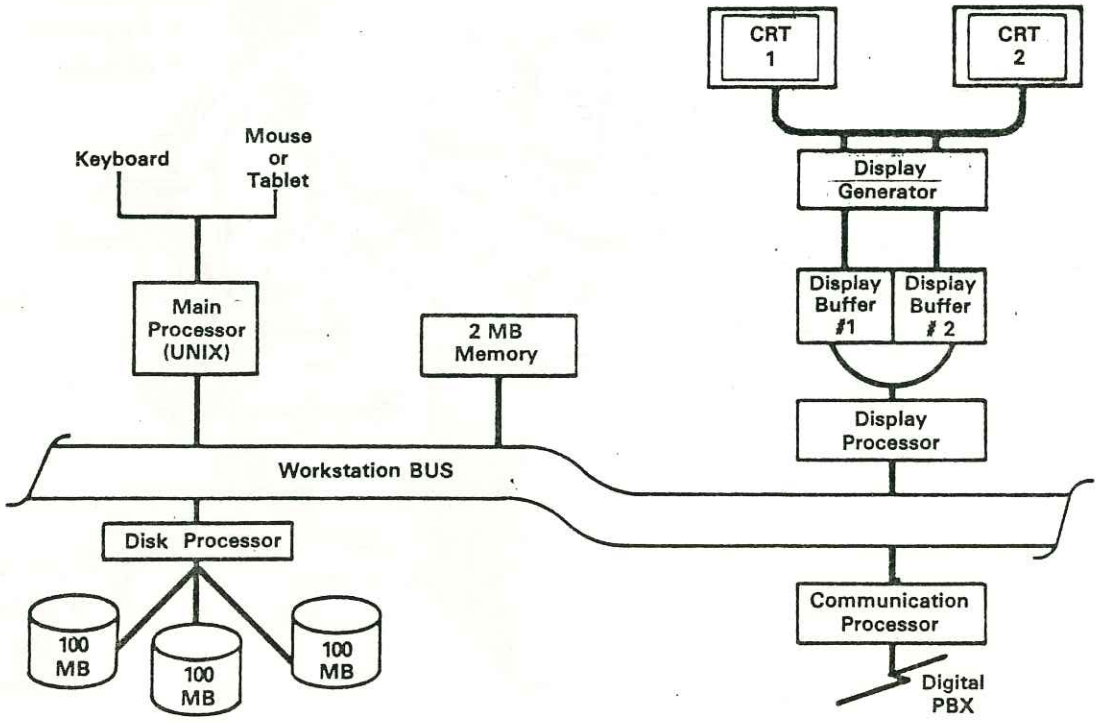
System Hardware

- 2MB Main Memory
- Up to 300 MB Disk Storage

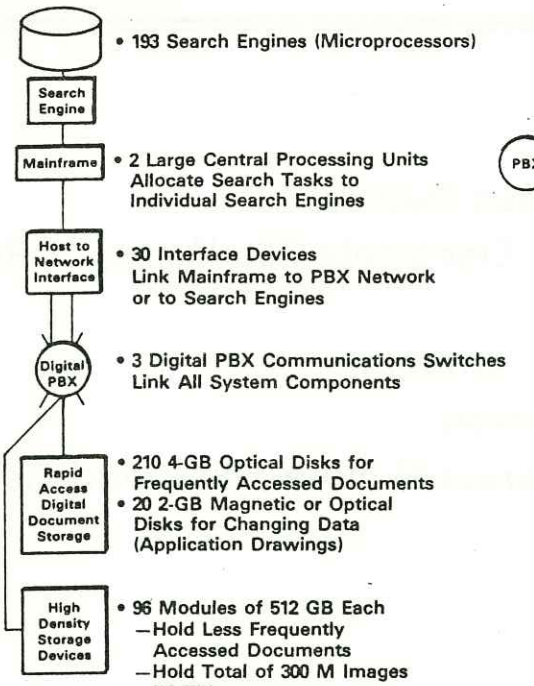
Workstation Ergonomics



Automated Patent System
Workstation - Electronic Components

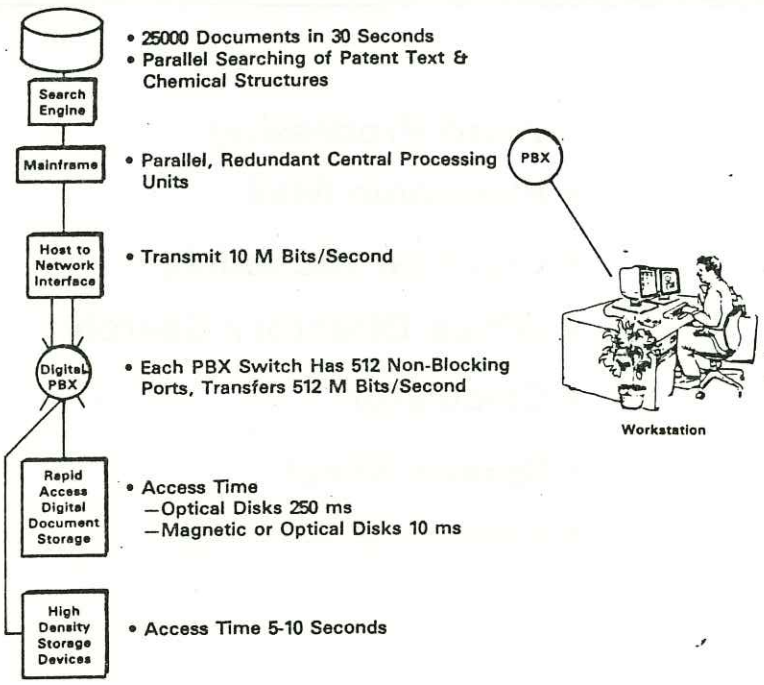


System Architecture-
Sizing of Components



- 193 Search Engines (Microprocessors)
- 2 Large Central Processing Units Allocate Search Tasks to Individual Search Engines
- 30 Interface Devices Link Mainframe to PBX Network or to Search Engines
- 3 Digital PBX Communications Switches Link All System Components
- 210 4-GB Optical Disks for Frequently Accessed Documents
- 20 2-GB Magnetic or Optical Disks for Changing Data (Application Drawings)
- 96 Modules of 512 GB Each
  - —Hold Less Frequently Accessed Documents
  - —Hold Total of 300 M Images (32 TB)
- 26 Office Automation File Servers Support Electronic Mail, Directory Searching, User Personal Files, Software Distribution
- 3000 User Workstations Perform:
  - —Search Request
  - —Document Retrieval
  - —Word Processing
  - —Electronic Mail/Calendar
- Full Page Display
  - —2000 Dual Screen
  - —1000 Single Screen
- Up to 300 MB Local Storage
- Workstation Laser Printer

System Architecture
Performance of Components



- 25000 Documents in 30 Seconds
- Parallel Searching of Patent Text & Chemical Structures
- Parallel, Redundant Central Processing Units
- Transmit 10 M Bits/Second
- Each PBX Switch Has 512 Non-Blocking Ports, Transfers 512 M Bits/Second
- Access Time
  - —Optical Disks 250 ms
  - —Magnetic or Optical Disks 10 ms
- Access Time 5-10 Seconds
- Full Page Display
  - —High Resolution 300 Ipi Screen
  - —Multiple Windows
- 10 Sec. to 1st Page in Class/Subclass Search
- Less Than 1 Sec/Page Flip Rate
- Workstation Laser Printer- 5 + Pages/Minute

APS Functions
Patent Processing

- Docket Status Review
- Application Electronic File Wrapper Review
- Search
- Application Amendment
- Action Creation
- Marginal/Personal Note Filing and Retrieval

APS Functions
Office Automation

- Word Processing
- Electronic Mail
- Calendar (Scheduler)
- Office Directory Search
- Calculator
- Spread Sheet
- Statistical Analysis

APS Access

Automated Patent System
USER: XXXX220
PASSWORD:

The system will not be available Thanksgiving Day.

Happy Holiday

Your mailbox contains new mail

- User Enters ID and Password
- System Verifies Access and Level of Privilege
- System Retrieves the User's Preferences for Command Forms

APS Main Menu

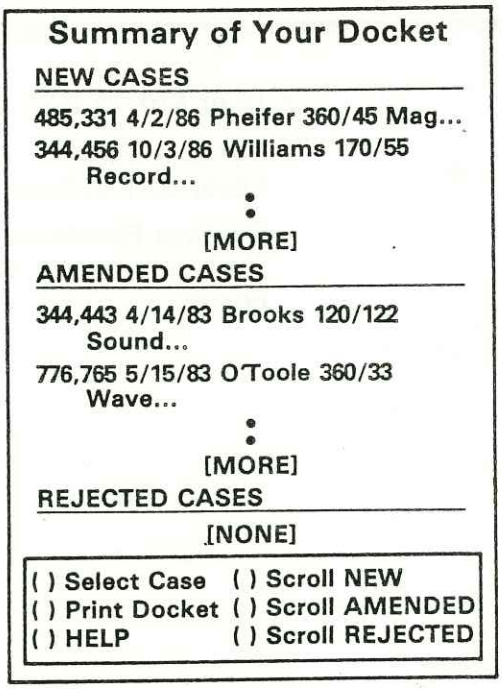
Patent Function Menu

1. Docket Processing
2. Application Browse
3. Local Search
4. Commercial Search
5. Action Creation
6. Electronic Mail
7. Calculator
8. Personal Notes
9. Marginal Notes

Option:_____

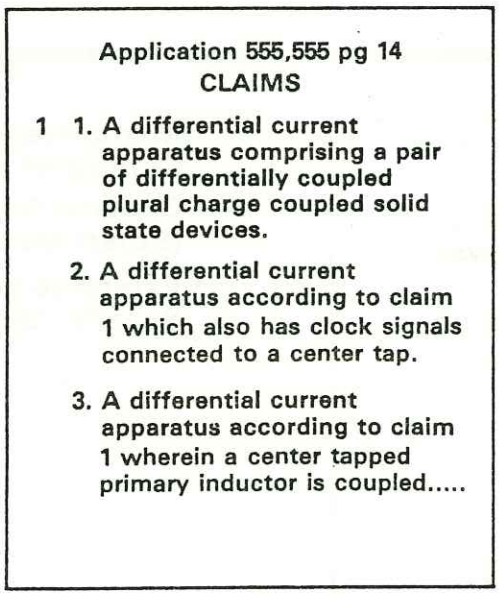
- Menu Based Selection of Command and Options
- Optional Command Language (Expert Mode)
- Extensive Use of User Specific Defaults

APS Docket Processing



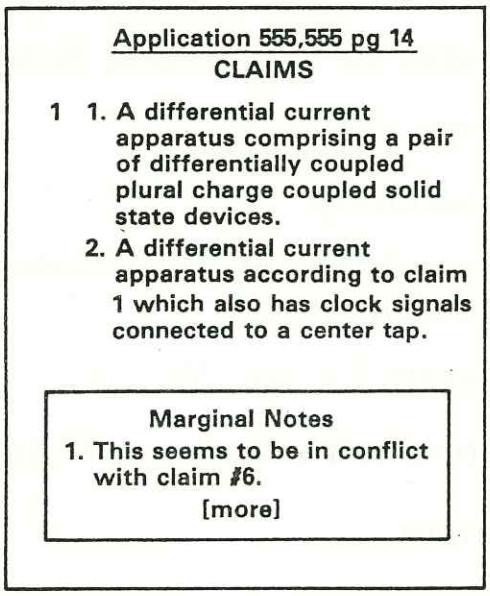
- Select Case To Be Displayed
- Scroll Through Docket
- Select Particular Type of Entry in Docket
- Search for Specific Entry - By Command
- Print the Docket
- Transfer an Application to Another Docket

APS Application Browse


Application 555,555 pg 14
CLAIMS
1 1. A differential current apparatus comprising a pair of differentially coupled plural charge coupled solid state devices.
2. A differential current apparatus according to claim 1 which also has clock signals connected to a center tap.
3. A differential current apparatus according to claim 1 wherein a center tapped primary inductor is coupled.....

- Display Table of Contents
- Display Next/Previous Section on Page
- Display a Specific Section
- Display a Specific Page
- Enter a Marginal Note (To Paragraph)
- Find a Specific Group of Characters/Words
- Print Application
- Display Marginal Notes

APS Notes Processing


Application 555,555 pg 14
CLAIMS
1 1. A differential current apparatus comprising a pair of differentially coupled plural charge coupled solid state devices.
2. A differential current apparatus according to claim 1 which also has clock signals connected to a center tap.
Marginal Notes
1. This seems to be in conflict with claim #6.
[more]

- Display Any Existing Marginal Notes
- Scroll Display with Notes
- Determine Line (Paragraph) to Which Note Is Related.
- Store Marginal Note (With Electronic File Wrapper)
- Modify Contents of Note

Types of Searches Available With APS

- Class/Subclass Searches
- Text Searches
- Chemical Structure Searches
- Bibliographic
- Combined

APS Text Search Capabilities

- Classification Index or Definitions Browsing
- Field Qualification
- Word/Phrase Searching
- Boolean Operators (and, or, not) with Unlimited Nesting of Terms/Operators
- Proximity Operators ($\pm$ No. Words)
- Numeric Operators with Numeric Data
- Search Refinement

APS Text Search Example

USPTO LOCAL SEARCH

L1: Magnetic & Head
48210 Postings
L2: L1 & Ferrite & Permalloy
12 Postings
L3: L2 & 360*123/cls

Retrieve

Search Command Options

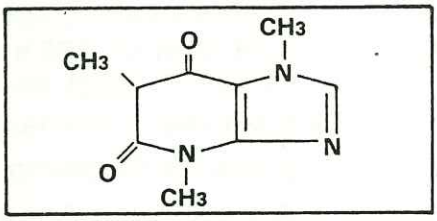
- Retrieve by Class/ Subclass, Word Search
- Request Commercial Data Base Search
- Display Document Identifiers
- Retrieve Search Results to Local Storage for Browsing
- Maintain Search Questions Between Sessions

APS Chemical Structure Search

RN 58-08-2

IN 3,7-dihydro-1,3,7, trimethyl-1-H-purine

MF $C_9 H_{10} N_3 O_2$



- Input Structure With Mouse or Tablet
- Merge Existing Templates To Form Query
- Request Search of PTO Structure File or CAS Online

APS Application Amendment

Applicants Letter
Amendment B Page 2 Please Insert ------by Rod 17-----After "Wheel" on Page 14, Line 72 In Line 73, Change "Wheel" to ----Flange----

Normal Mode

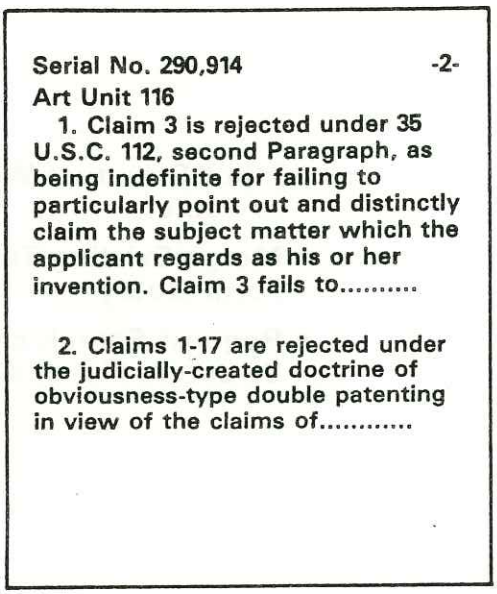
Line	Stored Application	Amend
72	Power to the Wheel [by Rod 17] and Sent to	B
73	The Front [Wheel] Flange that Connects to	B

Clean Copy Mode

Line	Stored Application	Amend
72	Power to the Wheel by Rod 17 and Sent to	B
73	The Front Flange That Connects to	B

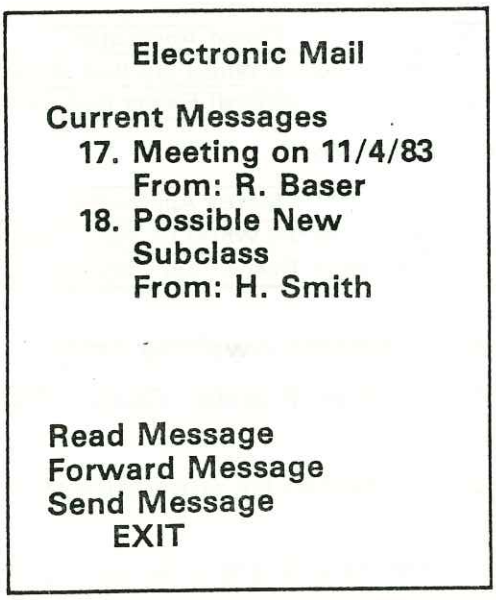
- Retrieve Docket of Amendments Awaiting Entry
- Select and Display Application, Position Cursor Where Amendment is Made
- Insert or Delete Data as Directed by Amendment at Cursor Position
- Indicate Amendment Complete-System Sends Updated Text to Data base

APS Action Creation


Serial No. 290,914 -2-
Art Unit 116
1. Claim 3 is rejected under 35 U.S.C. 112, second Paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as his or her invention. Claim 3 fails to.....
2. Claims 1-17 are rejected under the judicially-created doctrine of obviousness-type double patenting in view of the claims of.....

- Display Existing Action Status
- Determine Type of Action To Be Created
- Input by Examiner or Prepared for Clerical Input
- Create Document Skeleton
- Add Form Paragraphs
- Input Additional Text
- Enter or Remove from Examiner's Action Review Docket
- Add Item to SPE's Action Review Docket as Appropriate
- Print the Document
- Place on Outgoing Mail Docket
- Add/Replace Action in Electronic File Wrapper
- Update Application Status and Processing History

APS Electronic Mail



- Send Electronic Messages to Other APS Users
- Receive Electronic Messages from Other APS Users
- Permit Notification of Receipt and Reading
- Provide Copy Lists, Forwarding, and Answering Mail Messages
- Message Indication of Arriving Mail

APS Help/Tutor Function

APS HELP
TEXT SEARCH COMMAND

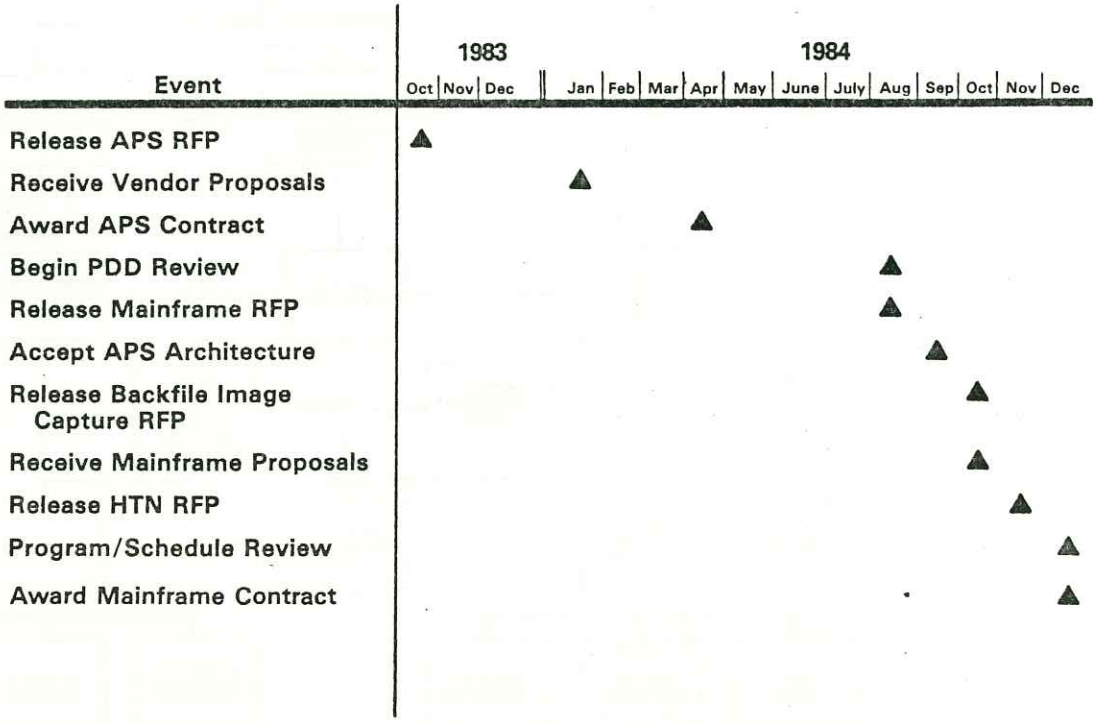
The SEARCH Command is used to specify the words which are to be used in the word search of the file. The words of interest should

[MORE]

[ ]More Detail [ ]Next Topic

- Provides Information on Expected Input
- Provides Tutorial

Patent Automation Accomplishments



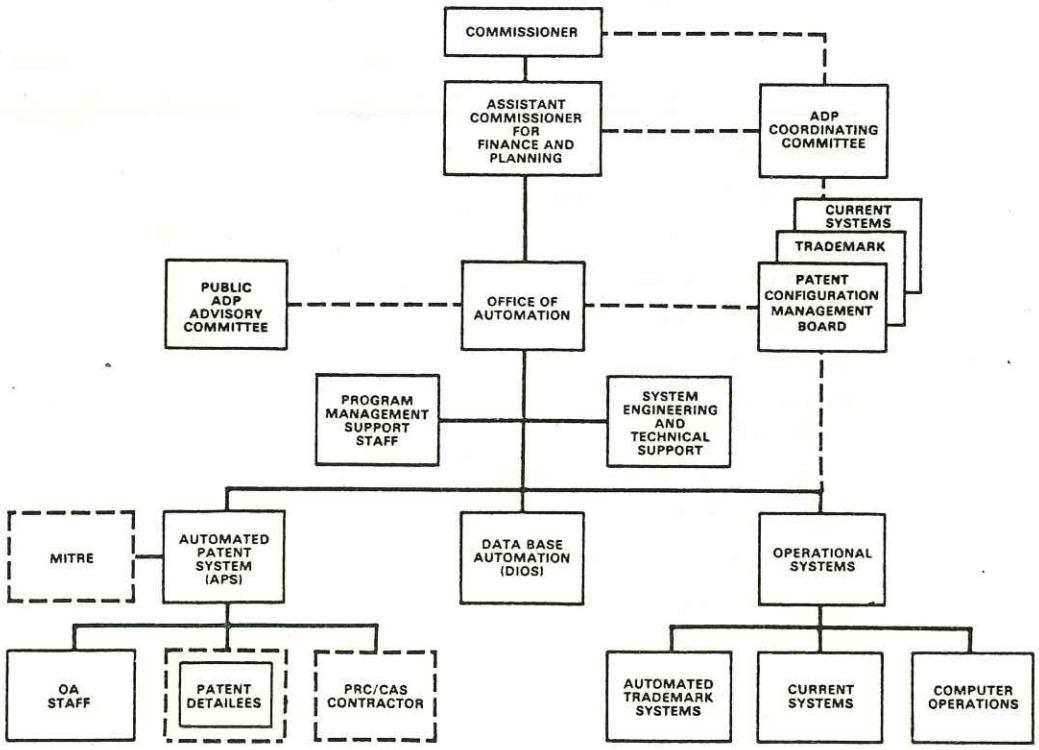
Patent Automation Future Activites

Complete Procurements:

- Host to Network
- PABX
- UNIX Based Processors
- Workstations
- Rapid Access Storage
- Laser Printers
- High Density Storage
- Image Capture for EPO

Complete Preliminary Design Review
Complete Critical Design Review
Capture Backfile of U.S. Patents - Group 220
Capture EPO Backfile - Group 220
Acquire Ongoing Text and Image Capability
Develop Operating Procedures
Prepare User Site
Train Operational Personnel
Train Users
Prepare Computer Site for Stage II

APS Organization for Program Management



Key User Considerations

- Mission Accomplishment
- Individual User Needs and Concerns

Mission Accomplishment

- Quality Search and Examination
- Achievement of Pendency Goals
- Improved Service to the Public
- Dissemination of Patent Information

Individual User Needs and Concerns- System Performance

- Capabilities of the Present Paper System
- Enhanced Capabilities
- Fast Response Time
- High Quality Images
- Reliability
- Adequately Tested Systems

Individual User Needs and Concerns- User Accomodation

- Good Ergonomics
- User Friendly System
- Flexible System Which Permits:
  - People Contact
  - Use of Paper Copy from APS
  - Search Strategy Options
  - Typing Options
  - Breaks from Terminal Use
  - User Customizing

Individual User Needs and Concerns-Other Concerns

- Effect on Jobs
- Training for Use of the System
- Disposal of the Paper Files
- Effect on Examiner Production Requirements
- Transition to Automation
- Future of Patent Classification System (U.S. and IPC)